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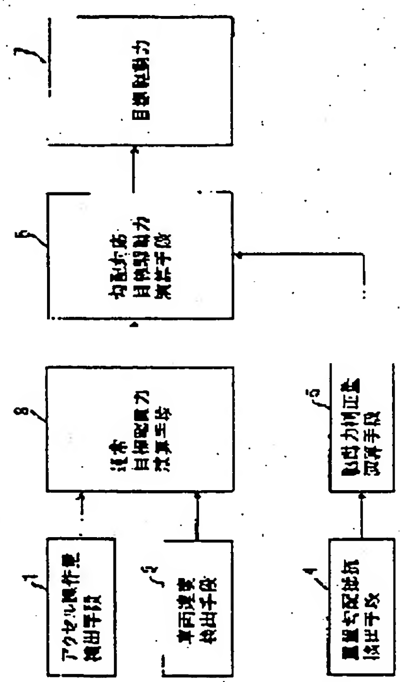
(54) VEHICLE DRIVING FORCE CONTROL DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an accelerating feeling free from a feeling of physical disorder regardless of a flat road and an ascending grade road without increasing memory capacity and the number of matching works.

SOLUTION: The target drive force of a vehicle at a flat road according to detected accelerator operation amount and vehicle speed is computed as an ordinary target drive force by a computing means 3. Detected weight grade resistance is set as 100% and a drive force correction of per cent therebelow is computed by a computing means 5. A value obtained by adding the computed drive force correction amount to an ordinary target drive force is computed as a target drive force corresponding to a grade by a computing means 6 and this target drive force corresponding to a grade is realized by a realizing means 7.



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* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates to that from which vehicles driving force is obtained corresponding to the inclination of a vehicles driving force control unit, especially a run way.
[0002]
[Description of the Prior Art] There are some which change a gear change property and were controlled so that it may become the optimal property according to the inclination of a run way from the former (refer to ** JP,59-8698,B and ** JP,8-219242,A). ** judging a flat way or a climb way and switching a gear change map -- moreover, ** -- the time of a climb run -- the inclination of a road surface -- responding -- continuous -- a change gear ratio -- an amendment -- make it acceleration not become blunt according to inclination by things, respectively
[0003]
[Problem(s) to be Solved by the Invention] However, in **, since any relation cannot be found between the driving force obtained based on the change gear ratio amended according to inclination, and the driving force which a driver actually expects, with the driving force obtained based on the change gear ratio amended according to inclination, acceleration may carry out and a driver may sense shortage of acceleration for Japanese cryptomeria or this reverse.
[0004] On the other hand, in **, it is possible to match the gear change map for climb ways so that the driving force which a driver expects on a climb way may be obtained. However, it not only increases memory space, but in suiting also considering the inclination which changes the gear change map for climb ways variously as a parameter, the man day of conformity becomes huge.
[0005] Then, this invention so that the driving force property for flat ways may be beforehand set that the feeling of acceleration which can be satisfied [with a flat way] of a driver is obtained and the feeling of acceleration which can be satisfied [with a flight inclination way] of a driver may be obtained It aims at the feeling of acceleration which always does not have sense of incongruity regardless of a flat way and flight inclination way being obtained, without increasing memory space and a conformity man day by adjusting amendment driving force to the driving force property for flat ways.
[0006]
[Means for Solving the Problem] A means 1 by which the 1st invention detects an accelerator control input as shown in drawing 10 , A means 2 to detect vehicles speed, and the these-detected accelerator control input and a means 3 to usually calculate the target driving force of the vehicles in the flat way according to vehicles speed as target driving force tTd n, A means 4 to detect the weight hill climbing resistance (force) RFORCE, and a means 5 to calculate amount of driving force amendments deltaRFORCE of the percent below this for this detected weight hill climbing resistance RFORCE as 100%, It has a means 6 to calculate the value which added this calculated amount of driving force amendments deltaRFORCE to the aforementioned usual target driving force tTd n as inclination correspondence target driving force tTd, and a means 7 to realize this inclination correspondence target

driving force tTd.
[0007] In the 2nd invention, the aforementioned amount of driving force amendments deltaRFORCE is 30% - 70% of the size of the aforementioned weight hill climbing resistance RFORCE in the 1st invention.
[0008] In the 3rd invention, it is the value of the aforementioned amount of driving force amendments deltaRFORCE to the aforementioned weight hill climbing resistance RFORCE which becomes small comparatively as the aforementioned weight hill climbing resistance RFORCE becomes large in the 1st invention.
[0009] A means 1 by which the 4th invention detects an accelerator control input as shown in drawing 11 , A means 2 to detect vehicles speed, and the these-detected accelerator control input and a means 3 to usually calculate the target driving force of the vehicles in the flat way according to vehicles speed as target driving force tTd n, A means 141 to set up beforehand the target driving force which is equivalent to the value added to the aforementioned usual target driving force tTd n in the value of the percent not more than this considering the predetermined weight hill climbing resistance RFORCE S which is not a flat way as 100% as inclination correspondence criteria target driving force tTd up, A means 4 to detect the weight hill climbing resistance (force) RFORCE, and a means 142 to calculate the interpolation coefficient beta 0 from this detected weight hill climbing resistance RFORCE and the aforementioned predetermined weight hill climbing resistance RFORCE S, It has a means 143 to calculate the value which carried out interpolation calculation of the aforementioned inclination correspondence criteria target driving force tTd up and the aforementioned usual target driving force tTd n using this interpolation coefficient beta 0 as inclination correspondence target driving force tTd, and a means 7 to realize this inclination correspondence target driving force tTd.
[0010] In the 5th invention, it sets to any one invention from the 1st to the 4th. the aforementioned inclination correspondence target driving force realization means 6 A means to control the target I/O rotational frequency ratio tRATIO of a change gear according to the vehicles speed VSP by which detection was carried out [aforementioned] with the inclination correspondence target driving force tTd by which the operation was carried out [aforementioned], A means to realize this target I/O rotational frequency ratio tRATIO of a change gear, and a means to calculate the value which broke the inclination correspondence target driving force tTd by which the operation was carried out [aforementioned] by this realized I/O rotational frequency ratio RATIO as a target engine output torque tTe, It consists of a means to realize this calculated target engine output torque tTe.
[0011] In the 6th invention, a means 4 to detect the aforementioned weight hill climbing resistance in any one invention from the 1st to the 5th consists of a means of vehicles to detect a position absolutely, a means to presume from the map information which has beforehand the inclination of the road where vehicles exist based on this detection value, and a means to calculate a weight hill climbing resistance from this presumed road grade.
[0012] A means by which a means 4 to detect the aforementioned weight hill climbing resistance in any one invention from the 1st to the 5th calculates driving shaft turning effort in the 7th invention, A means to calculate the running resistance used as the criteria in the flat way according to the aforementioned vehicles speed as criteria running resistance, It consists of a means to detect the acceleration of vehicles, a means to presume the acceleration resistance (force) of vehicles based on this detected acceleration, and a means to presume the value which deducted the aforementioned criteria running resistance and the aforementioned acceleration resistance from the driving shaft turning effort by which the operation was carried out [aforementioned] as the aforementioned weight hill climbing resistance.
[0013]
[Effect of the Invention] By 1st invention, the feeling of acceleration which always does not have sense of incongruity regardless of a flat way and flight inclination way is usually obtained by making the amount of driving force amendments calculate, respectively so that the feeling of acceleration to which a driver can be satisfied [with a flight inclination way] of target driving force again may be obtained so that the feeling of acceleration which can be satisfied [with a flat way] of a driver may be obtained.
[0014] Moreover, what is necessary is just to carry out the multiplication of the less than one coefficient

to a weight hill climbing resistance, in order to calculate the amount of driving force amendments of the percent below this for a weight hill climbing resistance as 100%. namely, the high power mode which is inclination correspondence like equipment before since the target driving force (usually target driving force) in a flat way is convertible for the target driving force of inclination correspondence only by having one coefficient with one to a weight hill climbing resistance -- usually -- **** -- it is not necessary to have a different target map, and hypertrophy of ROM capacity and increase-ization of a matching man day can be prevented Moreover, the property tuning by change of a hill-climbing-resistance coefficient can be performed simple.
[0015] Thus, according to the 1st invention, the feeling of acceleration which always does not have sense of incongruity regardless of a flat way and flight inclination way will be obtained, without increasing memory space and a conformity man day.
[0016] According to the 2nd invention, since driving force amendment can be assisted without sense of incongruity in the time of a climb run etc., feeling neither the shortage of acceleration nor a feeling of a prop at the time of a climb run and the feeling of acceleration of always natural sensibility is obtained.
[0017] According to the 3rd invention, a natural feeling of acceleration can be directed, always making the sense of incongruity of a driver small, however inclination may change.
[0018] In the 4th invention, since it has a means with it to set up inclination correspondence criteria target driving force beforehand, a make lump can be performed simple to various constraints. For example, it is possible to set up inclination correspondence criteria target driving force so that it may not become the driving force in which an output is actually impossible with the output-torque property of the engine carried. Moreover, it is avoidable by setting up inclination correspondence criteria target driving force smaller than the target driving force in other run range (** and ** sport mode), for example to accelerate freely not related to the intention of a driver at the time of a change in sport mode, or to slow down. Or a setup which is always changed into an acceleration side as expected [of a driver] is also possible.
[0019] In deciding the target I/O rotational frequency ratio and target engine output torque of a change gear, in order to realize inclination correspondence target driving force, by the 5th invention, since it is made to decide previously the target I/O rotational frequency ratio of a change gear with late responsibility, inclination correspondence target driving force is realizable with sufficient responsibility.
[0020] In the 6th invention, a road grade can always be detected correctly, without being influenced by change of the driving force property by change of a vehicles state, such as a blowout, long term deterioration, etc. of a tire, since the road grade of the position where vehicles exist by positional information absolutely from the map information which it has beforehand, a satellite, etc. can be presumed. Moreover, since not only the road that exists but this inclination of a run way that is due to progress previously can be presumed now, the driving force amendment which predicts inclination is attained and more rapid response driving force amendment is attained for a driver.
[0021] In the 7th invention, since it is not necessary to form the new sensor for detecting a weight hill climbing resistance, a weight hill climbing resistance can be presumed very cheaply.
[0022]
[Embodiments of the Invention] Drawing 1 is the block diagram of the whole control system.
[0023] The output of an engine 101 is transmitted to a driving wheel (illustration ellipsis) through the automatic transmission 103 with a built-in torque converter. An automatic transmission here is an automatic transmission adapting the epicyclic gear and the clutch member of the owner stage. this invention is applicable also to nonstep variable speed gears, such as not the thing limited to the change gear of the owner stage but a V belt formula, a toroidal formula, etc.
[0024] The so-called electronics control throttle equipment 102 which carries out the opening-and-closing drive of the throttle valve is infixed in the inhalation-of-air path of an engine 101 by the motor etc., the air content inhaled by the engine 101 is adjusted by throttle-valve opening, and the output torque of an engine is controlled by it.
[0025] Since above electronics control throttle equipment 102 is driven, it has the throttle control module (henceforth, TCM) 51. In TCM51 to which the throttle-valve opening instructions from the power-train

control module (henceforth, PCM) 50 are transmitted, while changing throttle-valve opening instructions into motorised voltage and outputting to a motor, feedback control of the motorised voltage (throttle-valve opening) is carried out so that actual throttle-valve opening may be in agreement with the opening instructions from PCM50.

[0026] The accelerator control input signal from the accelerator control input (amount of treading in of accelerator pedal) sensor 105, In PCM50 into which the brakes operation signal from the brakes operation switch 106, the selection range signal from the range selection lever 107 of an automatic transmission, etc. are inputted It is based on these signals. Engine control (for example, mainly the amount of fuel supply to an engine 101 and control of ignition timing), Each control of automatic-transmission control (the gear position control to an automatic transmission 103, oil pressure control) and a braking force control (brake oil pressure control for every ring to the brake actuator 104) is performed.

[0027] On the other hand, 111 is a camera for photoing the situation ahead of vehicles as a picture, and the signal from a camera 111 is processed as a front passage situation, a vehicles situation, obstruction information, etc. with an image processing system 53, and is transmitted to the external-environment information processing module 52.

[0028] 113 is the GPS antenna 113 which receives the signal from a satellite, and the information from a satellite is transmitted to the positional information processor 54 in order to grasp the current position of vehicles. In the positional information processor 54 which stores the map information which incorporated the attribute on geography, each information on a passage, etc. beforehand as record media, such as CD-ROM, the information on the area which exists from this information and the signal from the aforementioned GPS antenna 113 now etc. is summarized, and it transmits to the external-environment information processing module 52.

[0029] By the external-environment information processing module 52, the environment of the present vehicles is summarized appropriately, it transmits to PCM50, and the output of the aforementioned engine 101, gear change of an automatic transmission 103, etc. are controlled by PCM50 in response to this signal. PCM50 transmits the signal state from the output-torque information on an engine 101, the gear positional information of an automatic transmission 103, the accelerator opening sensor 105, and the brakes operation switch 106 etc. to this reverse at the external-environment information processing module 52. By the external-environment information processing module 52, in response to this signal, the judgment precision of an external environment may be raised or an operator's state of mind may be guessed.

[0030] With the 1st operation gestalt of this invention, the target driving force for flat ways is usually beforehand set that the feeling of acceleration which can satisfy a driver is obtained as target driving force on the flat way, and amendment driving force is adjusted to the aforementioned usual target driving force so that the feeling of acceleration which can satisfy a driver also at the time of a flight inclination run may be obtained.

[0031] The block diagram of drawing 2 explains this control performed by above-mentioned PCM50.

[0032] The desired value of the vehicles driving force at the time of a flat way run as which the accelerator control input APO detected by the accelerator control input sensor 105 and the vehicles speed VSP detected by the vehicles speed-detection means 11 are inputted is usually set up as target driving force tTd n by responding to these values with the target driving force setting means 12.

[0033] The inclination correspondence target driving force operation means 15 consists of an amount operation means 16 of driving force amendments (from a multiplication means to composition), and a driving force amendment means (from an addition means to composition) 17. With an amount operation means 16 of driving force amendments by which the weight hill climbing resistance RFORCE detected by the weight hill-climbing-resistance detection means 14 is inputted Amount of driving force amendments deltaRFORCE (= alphaxRFORCE) is calculated by carrying out the multiplication of the hill-climbing-resistance coefficient alpha (however, 0< alpha<1) to this weight hill climbing resistance RFORCE. The value of this amount of amendments deltaRFORCE is added to the above-mentioned usual target driving force tTd n in the driving force amendment means 17, and the inclination

correspondence target driving force tTd (= tTd n+delta RFORCE) is calculated.
[0034] Drawing 3 is the flow chart constituted corresponding to the block diagram of drawing 2 .
[0035] Although the portion which overlaps the place explained in drawing 2 comes out, if it explains regardlessly, drawing 3 will be performed every 10msec(s).
[0036] At Step 1, the accelerator control input APO, the vehicles speed VSP, and the weight hill climbing resistance RFORCE are read, among these the usual target driving force tTdn according to the accelerator control input APO and the vehicles speed VSP is set up in Step 2. Here, the target driving force tTd n is usually the desired value of the vehicles driving force at the time of a flat way run.
[0037] At Step 3, it asks for the inclination correspondence target driving force tTd (= tTd n+delta RFORCE) by carrying out the multiplication of the hill-climbing-resistance coefficient alpha (however, 0< alpha<1) to the weight hill climbing resistance RFORCE, calculating amount of driving force amendments deltaRFORCE (= alphaxRFORCE), and adding this value deltaRFORCE to the above-mentioned usual target driving force tTd n in Step 4.
[0038] Thus, with the 1st operation gestalt, a feeling of acceleration pleasant for a flat way and flight inclination way related always is obtained by making amount of driving force amendments deltaRFORCE calculate, respectively so that the feeling of acceleration to which a driver can usually be satisfied [with a flight inclination way] of the target driving force tTd n again so that the feeling of acceleration which can be satisfied [with a flat way] of a driver may be obtained may be obtained.
[0039] In this case, since it is convertible for the target driving force of inclination correspondence from the target driving force in a flat way only by having one hill-climbing-resistance coefficient alpha with one to the weight hill climbing resistance RFORCE, it is not necessary to have a different target map from usual [, such as high power mode which is inclination correspondence like equipment before,], and hypertrophy of ROM capacity can be prevented. Moreover, the property tuning by change of the hill-climbing-resistance coefficient alpha can be performed simple.
[0040] Drawing 4 is the hill-climbing-resistance coefficient operation means 31 of the 2nd operation gestalt.
[0041] With the 1st operation gestalt, to the hill-climbing-resistance coefficient alpha having been constant value, by the 2nd operation gestalt, the hill-climbing-resistance coefficient alpha is made small as the function RFORCE of the weight hill climbing resistance RFORCE, i.e., a weight hill climbing resistance, becomes large.
[0042] Here, the more a weight hill climbing resistance becomes large, the more having made the value of alpha small, so that the weight hill climbing resistance became large notes that a driver recognizes inclination strongly. That is, at the time of loose inclination, since a driver seldom notices inclination and it seldom changes an accelerator control input with it of a flat way, if the rate of amount of driving force amendments deltaRFORCE to a weight hill climbing resistance is not enlarged, it will become that the shortage of acceleration tends to be sensed. On the other hand, since a driver recognizes inclination and breaks in an accelerator pedal deeply intentionally, even if the rate of amount of driving force amendments deltaRFORCE [as opposed to a weight hill climbing resistance compared with loose inclination] is small, it does not sense the shortage of acceleration, as inclination becomes large. Then, if alpha is given so that the rate of amount of driving force amendments deltaRFORCE to a weight hill climbing resistance may become small as a weight hill climbing resistance becomes large, an always natural feeling of acceleration can be directed, making small the sense of incongruity which a driver holds, however inclination may change.
[0043] Moreover, changing the hill-climbing-resistance coefficient alpha among 30% - 70% can assist driving force amendment without sense of incongruity in the time of a climb run etc. because it is 30% - 70% of range of a weight hill climbing resistance. Feeling neither the shortage of acceleration nor a feeling of a prop at the time of a climb run and the feeling of acceleration of always natural sensibility is obtained by this.
[0044] Drawing 5 and drawing 6 are the 3rd operation gestalten, and replace drawing 2 of the 1st operation gestalt, and drawing 3 , respectively. In drawing 5 , the same step number is given for the same sign to the same portion as drawing 2 in drawing 6 again at the same portion as drawing 3 .

[0045] If a different portion from drawing 2 in drawing 5 is mainly explained, the content of the inclination correspondence target driving force operation means 41 differs from drawing 2 , and this consists of an inclination correspondence criteria target driving force setting means 42, a division means 43, and a target driving force interpolation calculation means 44.
[0046] Among these, with the inclination correspondence criteria target driving force setting means 42, the inclination correspondence criteria target driving force tTdup is called for by searching a predetermined map from the accelerator control input APO and the vehicles speed VSP. Here, the inclination correspondence criteria target driving force tTd up is the target driving force which is equivalent to the value usually added to the target driving force tTd n in the value of the percent below this considering the predetermined weight hill climbing resistance RFORCE S which is not a flat way as 100%, and is [as opposed to / the target driving force tTd n / usually / specifically] [0047].
[Equation 1] It is determined beforehand that it becomes tTd up=tTd n+alphaxRFORCE S.
[0048] On the other hand, by breaking the weight hill climbing resistance RFORCE (detection value) by the division means 43 by the above-mentioned predetermined weight hill climbing resistance RFORCE S, it is got blocked and is [0049].
[Equation 2] The interpolation coefficient beta 0 (dimensionless number) is calculated by the formula of beta0=RFORCE/RFORCE S, and it sets for the target driving force interpolation calculation means 44 using this interpolation coefficient beta 0, and is [0050].
[Equation 3] The inclination correspondence target driving force tTd is called for by the interpolation formula of tTd=beta 0xtTd up+(1-beta0) xtTd n.
[0051] For example, at the time of RFORCE=RFORCE S, it is set to beta0=1 and becomes tTd=tTd up from several 2 formulas from number 3 formula at this time.
[0052] In this way, with the 3rd operation gestalt, since it has a means with it to set up beforehand the inclination correspondence criteria target driving force tTd up, a make lump can be performed simple to various constraints. For example, it is possible to set up the inclination correspondence criteria target driving force tTd up so that it may not become the driving force in which an output is actually impossible with the output-torque property of the engine carried. Moreover, it is avoidable by setting up the inclination correspondence criteria target driving force tTd up smaller than the target driving force in other run range (** and ** sport mode), for example to accelerate freely not related to the intention of a driver at the time of a change in sport mode, or to slow down. Or a setup which is always changed into an acceleration side as expected [of a driver] is also possible.
[0053] Drawing 7 is the 4th operation gestalt and replaces drawing 2 of the 1st operation gestalt. The same sign is attached to the same portion as drawing 2 in drawing 7 .
[0054] Differing from drawing 2 in drawing 7 is the point that the target driving force realization means 61 is added.
[0055] This target driving force realization means 61 consists of the change gear I/O ratio control means 62, a change gear I/O ratio realization means 63, a target engine output-torque operation means 64, and an engine output-torque realization means 65.
[0056] First, in the change gear I/O ratio control means 62 into which the inclination correspondence target driving force tTd and the vehicles speed VSP are inputted, the target I/O rotational frequency ratio tRATIO of a change gear is called for by searching a predetermined map from these values. Although the map which asks for the target I/O rotational frequency ratio tRATIO from both parameters is used here, it is not restricted to this. For example, by I/O ratio control of a change gear, since the desired value of an input-shaft rotational frequency is calculated in many cases, after usually asking for a target input-shaft rotational frequency, you may ask for the target I/O rotational frequency ratio tRATIO by the relation with the vehicles speed VSP.
[0057] In this way, the called-for target I/O rotational frequency ratio tRATIO is realized by the change gear I/O ratio realization means 63.
[0058] With the target engine output-torque operation means 64, the target engine output torque tTe calculates by breaking the inclination correspondence target driving force tTd by the I/O rotational frequency ratio RATIO realized with the change gear 103. And with the engine-torque control means 66

and the engine output-torque realization means 65 which consists of engines 101, in order to realize the target engine torque tTe, a throttle control input, fuel oil consumption, ignition timing, etc. are controlled by the engine-torque control means 66, and the instructions (instruction values, such as a throttle control input, fuel oil consumption, and ignition timing) from the engine-torque control means 66 are sent to an engine 101.

[0059] In this way, with the 4th operation gestalt, since it is made to decide previously the target I/O rotational frequency ratio of a change gear with late responsibility in order to realize inclination correspondence target driving force in deciding the target I/O rotational frequency ratio and target engine output torque of a change gear, inclination correspondence target driving force is realizable with sufficient responsibility.

[0060] Drawing 8 is the 5th operation form and this shows how to presume the inclination of a road surface from the map data containing the altitude.

[0061] It considers presuming the inclination of the passage in the position of the vehicles 71 shown all over drawing in this drawing. In this case, the altitude data (a, b, c, d) of four grids of a section with which vehicles 71 exist if map information is divided in the shape of a grid as shown in drawing, and the altitude data of the lattice point (a black dot shows) are made to memorize, respectively are used, and each average gradient of X shaft orientations of the section and Y shaft orientations is [0062].

[Equation 4] Average-gradient =(a-b+c-d) /2L, however L of average-gradient =(d-b+c-a)/2LY shaft orientations of X shaft orientations: It is [0063], supposing vehicles 71 are running in the angle xi direction counterclockwise to X shaft orientations, since it is given by the formula of the interval of a grid.

[Equation 5] It can ask for the road grade theta of the position where vehicles 71 exist by the formula of tantheta={(d-b+c-a)/2L} xcosxi+{(a-b+c-d)/2L} xsinxi.

[0064] In addition, in order to ask for the weight hill climbing resistance RFORCE from this road grade theta, JP,8-219242,A is referred to, and it is [0065].

[Equation 6] RFORCE=mxgxsintheta, however the weight g of m:vehicles: What is necessary is just to use the formula of gravitational acceleration.

[0066] Here, although explained by the case where it is the map information altitude data are remembered to be in the shape of a grid, it is not restricted to this, and altitude data can be memorized on the point on a road, or a road grade can be presumed also by storing the inclination of a road in the point on a road.

[0067] Thus, with the 5th operation form, a road grade can be detected correctly, without being influenced by change of the driving force property by change of a vehicles state, such as a blowout, long term deterioration, etc. of a tire, since the road grade of the position where vehicles exist by positional information absolutely from the map information which it has beforehand, a satellite, etc. was presumed.

[0068] Moreover, since not only the road that exists but this inclination of a run way that is due to progress previously can be presumed now, the driving force amendment which predicted inclination is attained and more rapid response driving force amendment is attained for a driver. usually, even if it is going to presume a road grade from an output, driving force, vehicles acceleration, etc., real inclination is completely matched neither by operation delay nor the driving force transfer lag of vehicles (that is, gap arises) -- it is -- although -- it is predicting inclination and this gap can be avoided

[0069] Drawing 9 is the 6th operation form and this presumes a weight hill climbing resistance by calculating driving shaft turning effort and seasoning this with the criteria running resistance and the acceleration resistance in a flat way.

[0070] First, the driving shaft turning-effort operation means 81 mainly consists of an engine output-shaft torque operation means 82, a torque-amplification ratio operation means 83 of a torque converter, and a loss-torque presumption means 84 of a drive system. Among these, with the engine output-shaft torque operation means 82, the output-shaft torque Te of an engine is searched for by searching a predetermined map from the fuel oil consumption Tp and engine-speed ENGREV of an engine. With the torque-amplification ratio operation means 83 of a torque converter, when a ratio with the input-shaft

rotational frequency INPREV of engine-speed ENGREV and transmission (output-shaft rotational frequency of a torque converter) calculates as a change gear ratio SLPRTO and searches a predetermined map from this value, the torque-amplification ratio TAURTO of a torque converter is called for. With the loss-torque presumption means 84 of a drive system, loss-torque LOSSTRQ is calculated by searching a predetermined map most from the large operation oil pressure TGTPRS of influence in the loss torque of a drive system.
[0071] With the multiplication means 85, the multiplication of the torque-amplification ratio TAURTO of a torque converter is carried out to the output-shaft torque Te of an engine, the primary brake-horsepower torque Tin (=TexTAURTO) is searched for, and it is [0072] by the multiplication means 86 and the addition means 87.
[Equation 7] Tsec=TinxRATIO-LOSSTRQ, however RATIO: The output-shaft torque (= driving shaft turning effort) Tsec of a driving shaft is calculated by the formula of the I/O rotational frequency ratio of a change gear.
[0073] On the other hand, with the criteria running-resistance operation means 91, the criteria running resistance (the running resistance used as the criteria in a flat way) RLDTRQ is called for by searching a predetermined map from the vehicles speed VSP.
[0074] With the acceleration detection means 92, the vehicles acceleration GDATA is called for from the difference of the vehicles speed VSP, and the presumed acceleration resistance AccTRQ on an output shaft is called for in the acceleration-resistance force presumption means 93 by carrying out the multiplication of the equivalent weight Iv of the vehicles seen from the output shaft against this vehicles acceleration GDATA.
[0075] Thus, using the output-shaft torque Tsec of the above-mentioned driving shaft called for, the criteria running resistance RLDTRQ, and the presumed acceleration resistance AccTRQ, it sets for the weight hill-climbing-resistance presumption means 94, and is [0076].
[Equation 8] The weight hill climbing resistance RFORCE calculates by the formula of RFORCE=Tsec-RLDTRQ-AccTRQ.
[0077] Although vehicles acceleration is presumed from vehicles speed in drawing 9 , an acceleration sensor may detect direct vehicles acceleration.
[0078] In this way, with the 6th operation form, since it is not necessary to form the new sensor for detecting a weight hill climbing resistance, a weight hill climbing resistance can be presumed very cheaply.

[Translation done.]

* NOTICES *

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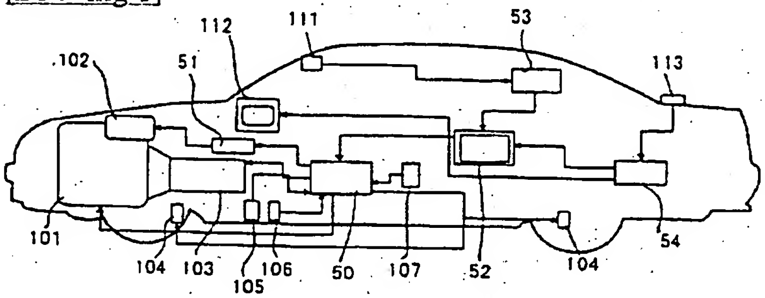
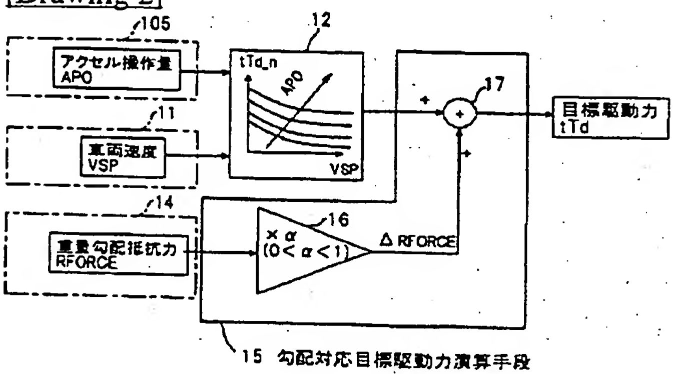
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

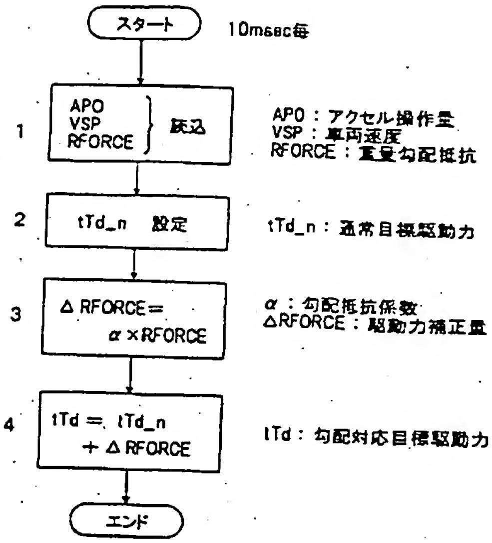
[Drawing 1]



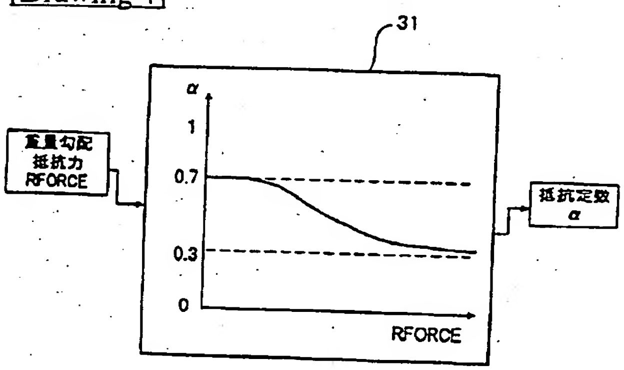
[Drawing 2]



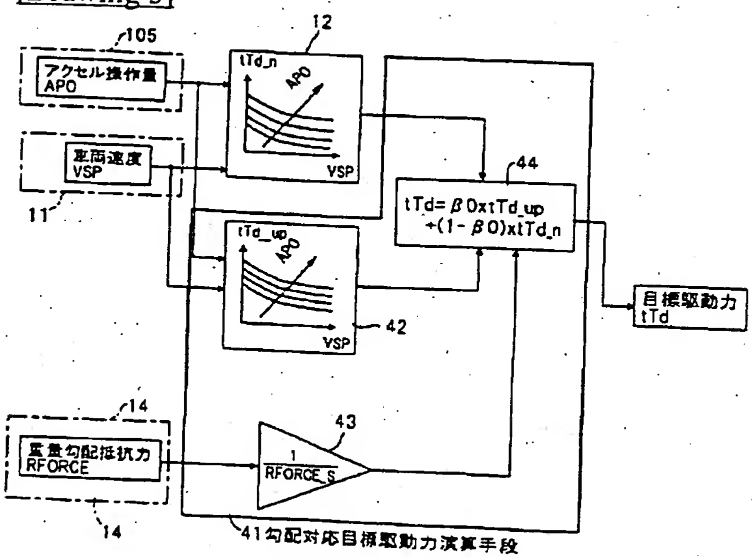
[Drawing 3]



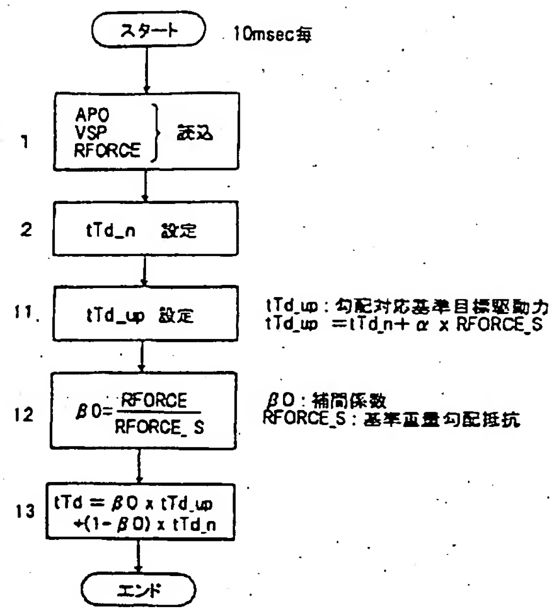
[Drawing 4]



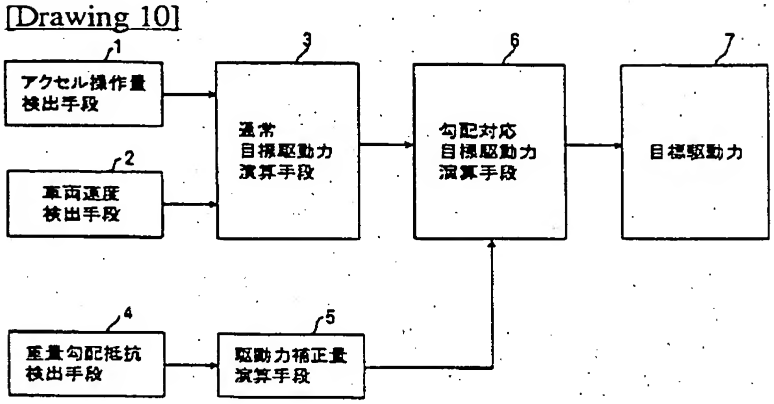
[Drawing 5]



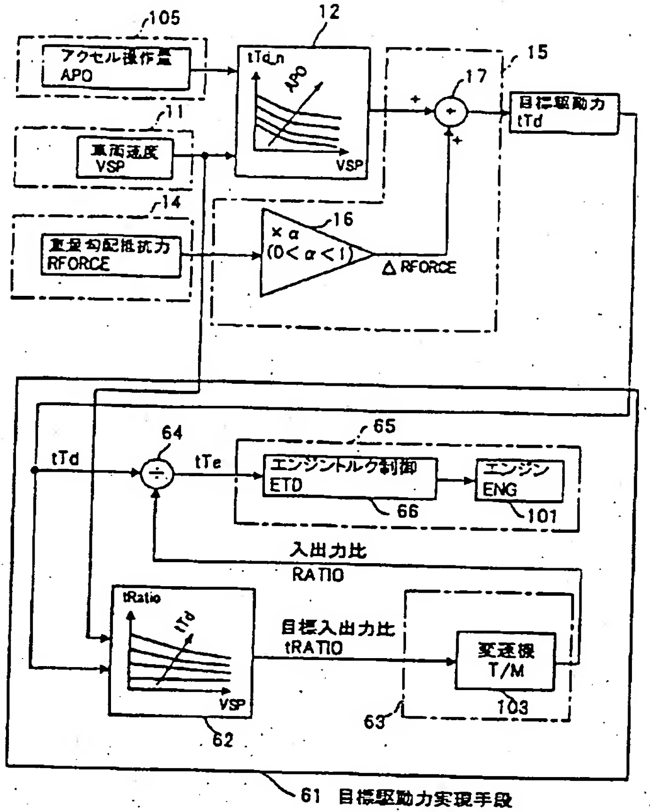
[Drawing 6]



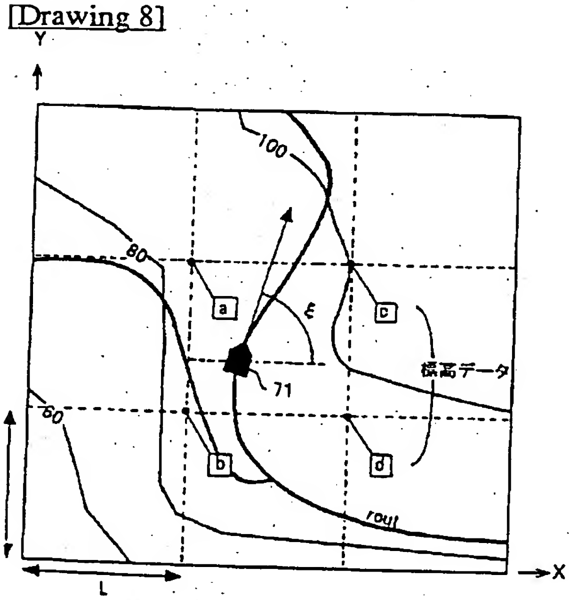
[Drawing 10]



[Drawing 7]

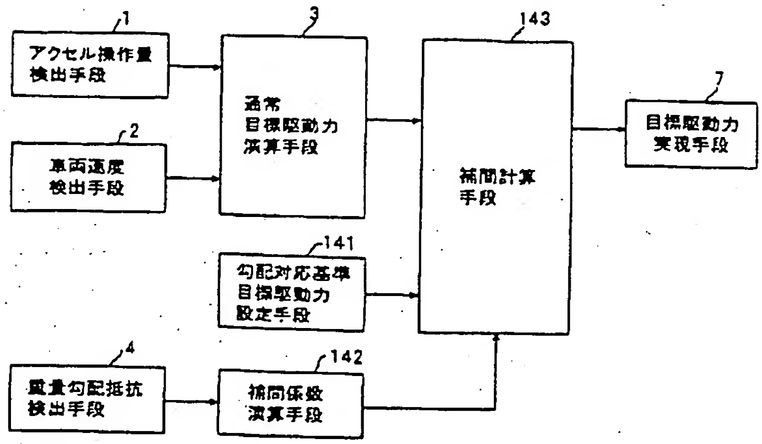


[Drawing 8]

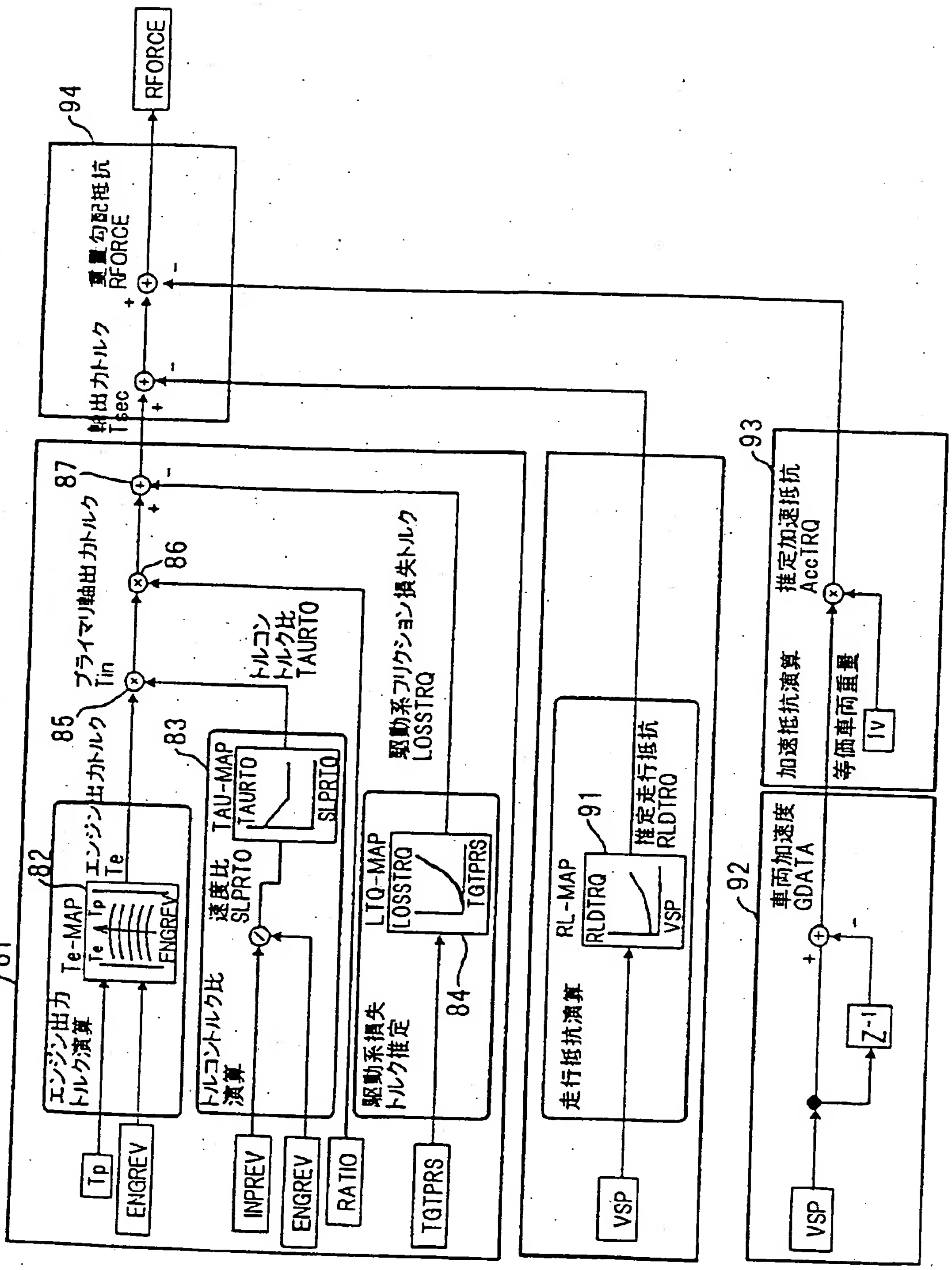


$$勾配\ \theta = \underbrace{\left(\frac{d-b+c-a}{2L}\right)}_{(\rightarrow 向きの傾き)} \times \cos\xi + \underbrace{\left(\frac{a-b+c-d}{2L}\right)}_{(\uparrow 向きの傾き)} \times \sin\xi$$

Drawing 11]


1
アクセル操作量
検出手段
2
車両速度
検出手段
3
通常
目標駆動力
演算手段
143
補間計算
手段
7
目標駆動力
実現手段
141
勾配対応基準
目標駆動力
設定手段
4
重量勾配抵抗
検出手段
142
補間係数
演算手段

[Drawing 9]



[Translation done.]

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(51)Int.Cl.⁷	識別記号	ＦＩ	テーマコード*(参考)
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// Ｆ１６Ｈ　59:18			
59:44			
59:66			

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最終頁に続く

(54)【発明の名称】　車両駆動力制御装置

(57)【要約】
【課題】　メモリ容量やマッチング工数を増大させることなく、かつ平坦路、登り勾配路に関係なく常に違和感のない加速感が得られるようにする。
【解決手段】　検出されたアクセル操作量と車両速度に応じた平坦路での車両の目標駆動力を通常目標駆動力として演算手段３が演算し、検出された重量勾配抵抗を100パーセントとしてこれ未満のパーセントの駆動力補正量を演算手段５が演算する。この演算された駆動力補正量を前記通常目標駆動力に加算した値を勾配対応目標駆動力として演算手段６が演算し、この勾配対応目標駆動力を実現手段７が実現する。